

LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A biomaterial for use in implantable orthopedic prosthetic devices which material:

- a. exhibits cytocompatibility with interfacing biological cells;
- b. exhibits mechanical functionality with interfacing biological cells;

and

c. exhibits osteoblast adhesion between the implant and the interfacing biological cells; wherein the biomaterial

- d. is a metal;
- e. has a grain size less than about 500 nanometers[[,]]; and
- f. has a surface roughness less than about 500 nanometers root mean square (nm rms).

2. (Currently amended) A biomaterial as in claim 1 wherein the surface roughness is between 11 and 356 ~~nm rms nanometers root mean square~~.

3. (Original) A biomaterial as in claim 2 which consists essentially of a titanium based metal.

4. (Currently amended) A biomaterial as in claim 3 wherein the titanium based metal has a particle size of less than about 500 nanometers and a surface roughness of about 11 ~~nm rms nanometers root mean square~~.

5. (Original) A biomaterial as in claim 4 wherein said titanium based metal is commercially pure titanium.

6. (Currently amended) A biomaterial as in claim [[4]] 1 wherein said titanium-based metal is a titanium based alloy consisting essentially of, on a weight percent basis, of about 11 % titanium, 39% aluminum and 50% vanadium.

7. (Currently amended) A biomaterial as in claim 1 wherein the metal, ~~which~~ on a weight percent basis, is a cobalt-chrome-molybdenum alloy consisting essentially of about 3% cobalt, ~~weight~~ 70% chromium and 27% molybdenum with the particle size less than about 200 nanometers and the surface roughness less than about 356 ~~nm~~ ~~nanometers~~_{nanometers} root mean square.

8. (Original) A biomaterial as in claim 1 wherein said metal is a powder.

9. (Currently amended) A biomaterial as in claim 8 wherein said powder is consolidated and compressed so as to form a surface ~~to interface for interfacing~~ with biological tissue.

10. (Original) A biomaterial as in claim 8 wherein said powder is compressed at room temperature.

11. (Currently amended) A method of forming an implantable orthopedic prosthetic device including the steps of:

(a) providing a biomaterial;

1. which exhibits cytocompatibility within interfacing biological cells;
2. exhibits mechanical functionality with interfacing biological cells;
and

3. exhibits osteoblast adhesion between the implant and interfacing biological cells; wherein said biomaterial
4. is a metal;
5. has a grain size less than about 500 nanometers; and
6. has a surface roughness between about 630 ~~360~~ and 11 ~~nanometers~~ root

mean square~~nanometers~~_{nanometers}; and

7. is provided in powder form; and
b. compressing the powder so as to form a surface for interfacing with biological cells.

12. (New) A biomaterial for use in implantable orthopedic prosthetic devices which material:

- a. exhibits cytocompatibility with interfacing biological cells;
- b. exhibits mechanical functionality with interfacing biological cells;

and

- c. exhibits osteoblast adhesion between the implant and the interfacing biological cells; wherein the biomaterial
- d. is a metal; and
- e. has a particle size less than 500 nanometers.

13. (New) A biomaterial for use in implantable orthopedic prosthetic devices which material:

- a. exhibits cytocompatibility with interfacing biological cells;
- b. exhibits mechanical functionality with interfacing biological cells;

and

- c. exhibits osteoblast adhesion between the implant and the interfacing biological cells; wherein the biomaterial
- d. is a metal;
- e. has a particle size less than 500 nanometers, and
- f. has a surface roughness less than 500 nanometers root mean square (nm rms).

14. (New) A biomaterial as in claim 13 wherein the surface roughness is between 11 and 356 nanometers root mean square.

15. (New) A biomaterial as in claim 14 which consists essentially of a titanium based metal.

16. (New) A biomaterial as in claim 13 wherein the metal on a weight percent basis, is a cobalt-chrome-molybdenum alloy consisting essentially of about 3% cobalt, 70% chromium and 27% molybdenum with the surface roughness less than about 356 nanometers root mean square.